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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,804	02/20/2004	Neil Holger Eklund	52493.000363	5187

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

EXAMINER

BAIRD, EDWARD J

ART UNIT	PAPER NUMBER
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3695

NOTIFICATION DATE	DELIVERY MODE
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10/21/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/781,804	Applicant(s) EKLUND ET AL.	
	Examiner Ed Baird	Art Unit 3695	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,7,11-13,16-20 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) 3-5,8-10,14,15,21,25 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 7, 11-13, 16-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The finality of the office action mailed 01 December 2008 is hereby rescinded. This office action hereby supersedes the office action mailed 01 December 2008.

Status of Claims

1. Applicant has amended claims 1, 2, 6, 7, 11-13, 16-20 and 22-24. Claims 3-5, 8-10, 14, 15, 21, 25 and 26 have been canceled. Thus claims 1, 2, 6, 7, 11-13, 16-20 and 22-24 are pending in the application and are presented for examination.

Response to Arguments

2. Applicant's arguments filed 23 July 2008 with respect to claims 1, 2, 6, 7, 11-13, 16-20 and 22-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 6, 7, 11 –13, 16 – 20, 22 - 24 rejected under 35 U.S.C. 103(a) as being unpatentable over **Josephson et al** (US Patent No. 7155423) in view of **Carey et al** (US Patent No. 7,206,760).

5. Regarding **claims 1 and 19**, **Josephson** teaches:

- a) generating a first set of solutions (of portfolio allocations) in a portfolio configuration space using a computing device, the portfolio configuration space having a plurality of dimensions;
- (b) generating a second set of solutions (in a portfolio performance space), the (portfolio performance) space having at least three dimensions; each solution in the first set of solutions matching with a corresponding solution in the second set of solutions;

Josephson uses a strategy of **dominance filtering** as applied to hybrid electric vehicle design (HEV), a domain of architecture of his invention [column 4 lines 51-67]. Design candidates are screened using four criteria [column 1 lines 54-60]. In particular, he uses trade-offs between city and highway efficiencies in miles per gallon [column 5 lines 18-33], and acceleration capacity [column 5 lines 34-48]. Examiner interprets these categories (efficiencies and acceleration capacity) as analogous to Applicant's **set of solutions**.

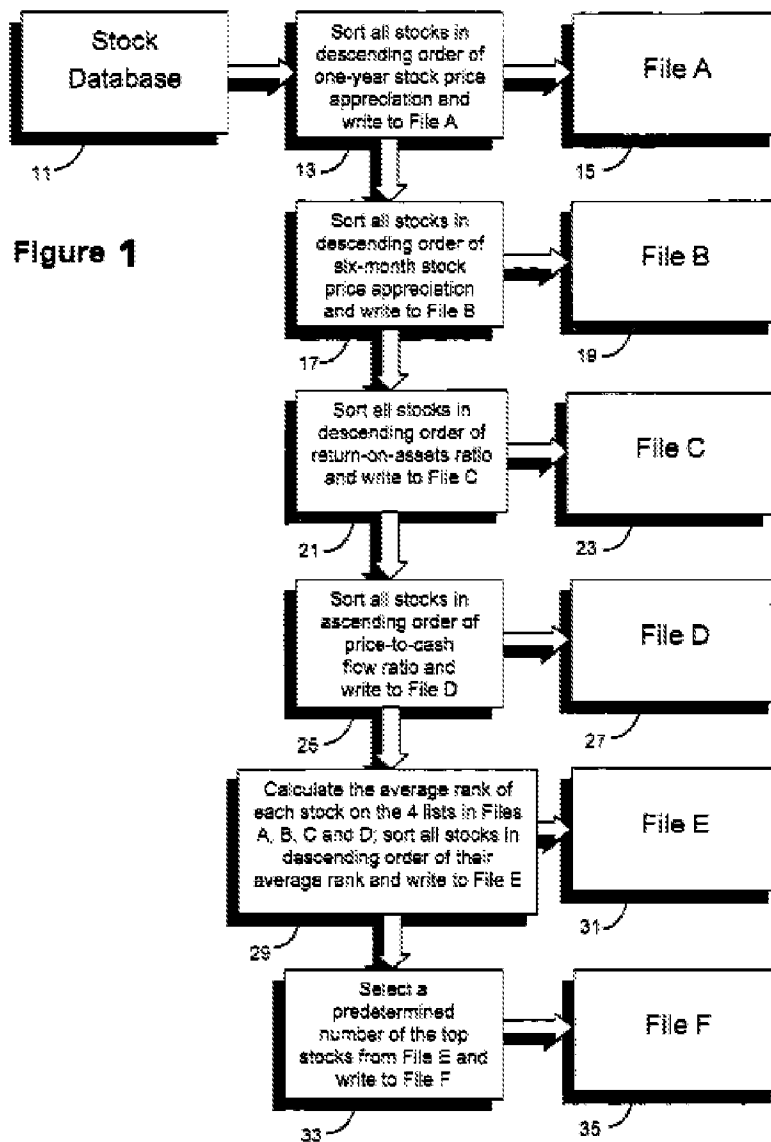
Josephson discloses a user discarding candidates which have worse performance than say acceleration of vehicle to 60 MPH in more than 12 seconds [see at least column 5 line 49 - column 6 line 9, and column 6 line 47- 53]. Examiner interprets this selection of "candidates for discarding" as analogous to Applicant's **removing the dominated solutions**.

Josephson does not explicitly apply his strategy of **dominance filtering** to portfolio allocations (of financial instruments). He also does not explicitly disclose:

- c) selecting a first dimension from the at least three dimensions of the portfolio performance space;
- d) generating bins for all remaining non-selected dimensions of the portfolio performance space
- e) determining a solution in each bin of the non-selected dimensions with maximum value along the selected dimension;

- (f) comparing the solution with the maximum value in each bin to other solutions in each bin to determine whether other solutions are dominant solutions or dominated solutions; and
- g) removing the dominated solutions from the portfolio performance space so as to result in a reduced set of solutions, the reduced set of solutions being used in investment decisions.

However, **Carey** teaches a strategy of defining an universe of securities for potential investment [column 1 lines 54-60] and uses statistical analysis to evaluate the price history of each [column 2 lines 4-18]. Stocks are sorted and stored according to magnitude of a stocks *one-year price appreciation* [column 2 line 55-63], magnitude of the company's *return-on-assets* [column 3 lines 17- 30], and *price-to-cashflow ratio* [column 3 lines 30-44]. He further discloses sorting all stocks in descending order of *one-year price appreciation* and writing to File A, descending order of *six-month price appreciation* and writing to File B, descending order of *return-on-assets ratio* and writing to File C, and **ascending** order of *price-to-cash flow ratio* and writing to File D [Figure 1]. Examiner interprets these *Files A, B, C, and D* as analogous to Applicant's **bins of the portfolio performance space** whereas the parameters *one-year price appreciation*, *six-month price appreciation*, *return-on-assets ratio*, and *price-to-cash flow ratio* as analogous to Applicant's **dimensions** with a maximum value. Examiner notes that *maximum values* - extreme values - are inherent when sorting stocks in ascending or descending orders of magnitude.



Carey then sorts and organizes stocks according to the magnitude of each company's average ranking in each of these categories. He discloses:

After File D has been completed, the step indicated by diagram block 29 is performed in which the stocks are sorted, or organized, according to the magnitude of the company's average rank on the four lists in Files A, B, C, and D. (For example, a stock that happened to be ranked first in Files A and B, i.e., happened to have the greatest

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one-year and six-month PAVs, and was ranked second in Files C and D, i.e., had the second highest return-on-assets ratio and the second lowest price-to-cashflow ratio, would have an average rank of $(1+1+2+2)/4$ or 1.5.) The sorting may be done by organizing the stocks in descending order of their average rank. (A stock with an average rank of 1.5 would be listed ahead of a stock with an average rank of 2.0, etc.) The sorted stock names are written to File E, as shown in diagram block 31 [column 3 lines 45-59].

Examiner notes that *sorted stocks which are written to File E* as analogous to Applicant's **set of solutions**. Examiner notes that herein **Carey** discloses *comparing ranks of stocks among files A, B, C, and D* as analogous to Applicant's limitation:

- (f) comparing the solution with the maximum value in each bin to other solutions in each bin to determine whether other solutions are dominant solutions or dominated solutions.

Carey further discloses in claim 1:

A computer-implemented method for selecting securities from a group of available securities for an investment portfolio, comprising:

- said computer performing the steps of calculating price appreciation for each of said available securities;
- calculating a return on assets ratio for each of said available securities;
- calculating a price to cashflow ratio for each of said available securities;
- ranking at least some of the available securities to form a group of ranked securities, said ranking comprising ranking according to said price appreciation to assign each of said available securities one or more separate price appreciation ranks, ranking according to said return on assets ratio to assign each of said available securities a separate return on assets ratio rank, ranking according to said price to cashflow ratio to assign each of said available securities a separate price to cashflow rank, and determining for each of said available securities an average rank comprising the average of the one or more separate price appreciation ranks, separate return on assets ratio rank and separate price to cashflow ratio rank for said security; and

- selecting at least some of the ranked securities to form a group of selected securities; wherein at least one of the steps of calculating, ranking, and selecting is carried out by a computer.

Examiner notes that the limitation of “selecting at least some of the ranked securities to form a group of selected securities” as claimed by **Carey** is analogous to Applicant’s **removing the dominated solutions from the portfolio performance space so as to result in a reduced set of solutions**.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of instant invention to use **Josephson’s** invention along with *generating a portfolio of top performing stocks* as taught by **Carey** because such portfolios may give investors comfort in knowing what they own [**Carey** column 4 lines 24-25], may allow diversification across many securities [**Carey** column 4 lines 27-30], and provide investors low expenses [**Carey** column 4 lines 31-34].

6. Regarding **claim 2 and 12**, **Josephson** teaches:

- the step of repeating steps (c) - (g) for at least a second dimension of the portfolio performance space after the dominated solutions are removed from the portfolio performance space [see at least column 5 line 61 – column 6 line 9, and claim 11].

7. Regarding **claims 6 and 22**, **Josephson** teaches:

- the plurality of dimensions is n dimensions, and the bins are in the form of $n-1$ dimensional polyhedra in the portfolio performance space.

Josephson teaches finding more trade-offs using secondary criteria [see at least column 6 lines 58 -67, column 23 lines 35 – 46, and Figures 14 and 15]. Examiner interprets secondary criteria as analogous to Applicant’s n dimensions and polyhedra as space represented in Figure 14 and 15.

8. **Claims 7 and 23** are not further limiting to the claims upon which they depend.

9. Regarding **claim 11**, **Carey** teaches:

- the investment decisions are based on competing objectives that include risk and return.

Carey discloses that Portfolios are designed to fill a variety of investment needs and risk tolerance levels [column 1 lines 24-25]. Examiner interprets *needs and risk tolerance* as inclusive of Applicant's risk and return.

Thus, this claim is rejected for the same reason as claim 1, the claim upon which it depends.

10. Regarding **claim 13**, **Josephson** teaches:

- a coarseness of the bins is decreased as remaining dimensions of the portfolio performance space are selected.

Josephson discloses using dominance filtering to dominate candidates resulting with Pareto optimal candidates [column 4 lines 30-45]. Examiner interprets *Pareto optimal* as indicative of Applicant's **decreasing coarseness of bins**.

11. Regarding **claim 16**, **Josephson** teaches:

- the step of performing the final dominance check on the reduced set of solutions includes generating an efficient frontier.

Josephson discloses filtering using a threshold [see at least column 4 lines 45-50, and column 22 lines 31-61]. Examiner interprets **Josephson's threshold** as analogous to Applicant's **efficient frontier**.

12. Regarding **claim 17**, **Josephson** teaches:

- step of generating the first set of solutions of portfolio allocations includes using an evolutionary algorithm.

Josephson discloses using *domain-specific techniques and algorithms* [see at least column 4 lines 22-29, and **Josephson's** claim 16]. Examiner interprets these algorithms to include Applicant's **evolutionary algorithm**.

13. Regarding **claim 18**, **Josephson** teaches:

- the step of comparing the solution with the maximum value in each bin to other solutions in each bin includes using Pareto dominance that includes uncertainties in measuring competing objectives [see at least column 1 line 55 – column 2 line 7].

14. **Claim 20** is not further limiting to the claim 19, the claim upon which it depends.

15. Regarding **claim 24**, **Josephson** teaches:

- the dominance filtering portion performs a final dominance check on the final reduced set of solutions

This claim is similar and not further limiting than claim 16 and is thus rejected for the same reasons as claim 16.

Conclusion

The prior art of record and not relied upon is considered pertinent to Applicant's disclosure:

- **Knowles et al**: "Bounded archiving using the lebesgue measure", (This paper appears in, 2003. "The 2003 Congress on Evolutionary Computation", CEC '03. Volume: 4, On page(s): 2490- 2497 Vol.4, ISBN: 0-7803-7804-0, Published: 8-12 Dec. 2003.
- **Yao et al**: "Hardware Design Using Evolution Algorithms", (WO 02/075650, International Publication Date: 26 September 2002).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ed Baird whose telephone number is (571)270-3330. The examiner can normally be reached on Monday - Thursday 7:30 am - 5:00 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Kyle can be reached on (571) 272-6746. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ed Baird/
Examiner, Art Unit 3695

/Charles R. Kyle/
Supervisory Patent Examiner, Art Unit 3695